

IN THE CLAIMS

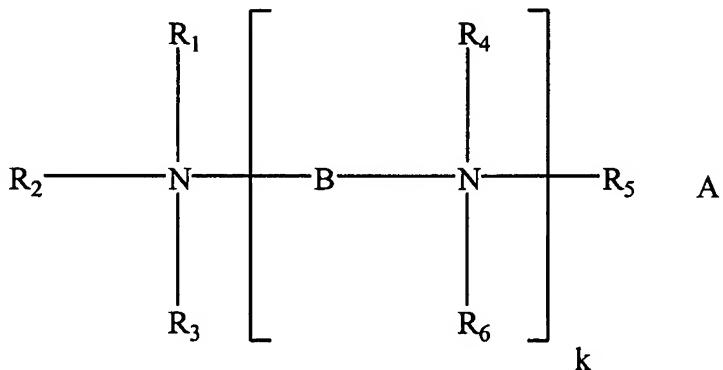
Please amend the claims under the provisions of 37 CFR §1.121(a)(2)(ii), so that they appear as follows:

1-17. (CANCELED).

18. (CURRENTLY AMENDED) A composition for the intracellular delivery of exogenous compounds into cells, said composition comprising:

- a) a cationic cytofectin;
- b) an exogenous compound desired for intracellular delivery; and
- c) optionally, a neutral lipid;

wherein said cationic cytofectin is a compound of the formula:



wherein,

A is chloride, bromide, iodide, hydrogen phosphate (HPO<sub>4</sub><sup>2-</sup>), dihydrogen phosphate (H<sub>2</sub>PO<sub>4</sub><sup>-</sup>), sulfate, thiosulfate, hydroxy, or oxalate;

k is 1, 2, 3, 4 or 5;

B is the alkandiyl bridge (CH<sub>2</sub>)<sub>n</sub>, wherein n is 1, 2, 3, 4, 5, 6, 7, 8, 9, or 10;

R<sub>1</sub>, R<sub>3</sub>, R<sub>4</sub>, are identical or different, and denote hydrogen, straight-chained or branched C<sub>1</sub>-C<sub>6</sub>-alkyl, C<sub>1</sub>-C<sub>6</sub>-alkenyl, or C<sub>1</sub>-C<sub>6</sub>-alkynyl;

R<sub>2</sub> is straight-chained or branched C<sub>8</sub>-C<sub>20</sub>-alkyl, C<sub>8</sub>-C<sub>20</sub>-alkenyl, or C<sub>8</sub>-C<sub>20</sub>-alkynyl;

R<sub>5</sub> is, when k=1, straight-chained or branched C<sub>8</sub>-C<sub>20</sub>-alkyl, C<sub>8</sub>-C<sub>20</sub>-alkenyl, C<sub>8</sub>-C<sub>20</sub>

alkynyl; and R<sub>5</sub> is, when k > 1, hydrogen, straight-chained or branched C<sub>1</sub>-C<sub>6</sub>-alkyl, C<sub>1</sub>-C<sub>6</sub>-alkenyl, C<sub>1</sub>-C<sub>6</sub>-alkynyl; and

R<sub>6</sub> is, when k=1, hydrogen, straight-chained or branched C<sub>1</sub>-C<sub>6</sub>-alkyl, C<sub>1</sub>-C<sub>6</sub>-alkenyl, C<sub>1</sub>-C<sub>6</sub>-alkynyl; and R<sub>6</sub> is, when k>1, straight-chained or branched C<sub>8</sub>-C<sub>20</sub>-alkyl, C<sub>8</sub>-C<sub>20</sub>-alkenyl, C<sub>8</sub>-C<sub>20</sub>-alkynyl, and the repeating unit -B-NR<sub>4</sub>R<sub>6</sub> is identical to or different from one another; and wherein said exogenous compound desired for intracellular delivery is selected from the group consisting of nucleic acids, peptides, peptide derivatives, proteins, protein derivatives, steroids, hormones, carbohydrates, and pharmaceutical compounds thereof, wherein said composition has the ability to effect intracellular delivery of said exogenous compound in vivo or in vitro.

19. (previously presented) The composition according to claim 18, wherein  
k is 1, 2, or 3;  
n is 1, 2, 3, 4, 5, or 6;  
R<sub>1</sub>, R<sub>3</sub>, R<sub>4</sub>, are identical or different, and denote hydrogen, straight-chained or branched C<sub>1</sub>-C<sub>6</sub>-alkyl;

R<sub>5</sub> is, when k=1, straight chained or branched C<sub>8</sub>-C<sub>20</sub>-alkyl, C<sub>8</sub>-C<sub>20</sub>-alkenyl C<sub>8</sub>-C<sub>20</sub>-alkynyl, and R<sub>5</sub> is, when k > 1, hydrogen, straight-chained or branched C<sub>1</sub>-C<sub>6</sub>-alkyl; and

R<sub>6</sub> is, when k=1, hydrogen, straight chained or branched C<sub>1</sub>-C<sub>6</sub>-alkyl, C<sub>1</sub>-C<sub>6</sub>-alkenyl, C<sub>1</sub>-C<sub>6</sub>-alkynyl, and R<sub>6</sub> is, when k>1, straight-chained or branched C<sub>8</sub>-C<sub>20</sub>-alkyl, C<sub>8</sub>-C<sub>20</sub>-alkenyl, C<sub>8</sub>-C<sub>20</sub>-alkynyl, and the repeating unit -B-NR<sub>4</sub>R<sub>6</sub> is identical to one another.

20. (previously presented) The composition according to claim 18, wherein  
A is bromide, iodide, dihydrogen phosphate (H<sub>2</sub>PO<sub>4</sub><sup>-</sup>) or thiosulfate;  
k is 1 or 2;  
B is, when k=1, an alkandiyl bridge -(CH<sub>2</sub>)<sub>n</sub>, wherein n is 2, 3, or 4; and B is, when k=2, an ethylene bridge -(CH<sub>2</sub>-CH<sub>2</sub>)-;  
R<sub>1</sub>, R<sub>3</sub>, R<sub>4</sub>, are each CH<sub>3</sub>;  
R<sub>2</sub> is straight-chained C<sub>10</sub>-C<sub>20</sub>-alkyl;  
R<sub>5</sub> is, when k=1, a straight-chained C<sub>10</sub>-C<sub>20</sub>-alkyl and is identical to R<sub>2</sub>; and R<sub>5</sub> is, when k=2, a CH<sub>3</sub>;  
R<sub>6</sub> is, when k=1, a CH<sub>3</sub>; and R<sub>6</sub> is, when k=2, straight-chained C<sub>10</sub>-C<sub>20</sub>-alkyl and is identical to R<sub>2</sub>.

21. (previously presented) The composition according to claims 18, 19, or 20, wherein the C<sub>1</sub>-C<sub>6</sub>-alkyl group is substituted with one or more halogens.
22. (previously presented) The composition according to claim 21, wherein the halogen is fluorine.
23. (previously presented) The composition according to claim 18, wherein the C<sub>1</sub>-C<sub>6</sub>-alkyl group is selected from the group consisting of methyl, ethyl, propyl, isopropyl, butyl, 1-methylpropyl, 2-methylpropyl, 1,1-dimethylethyl, n-pentyl, 1-methylbutyl, 2-methylbutyl, 3-methylbutyl, 1,1-dimethylpropyl, 1,2-dimethylpropyl, 2,2-dimethylpropyl, 1-ethylpropyl, hexyl, 1-methylpentyl, 2-methylpentyl, 3-methylpentyl, 4-methylpentyl, 1,1-dimethylbutyl, 1,2-dimethylbutyl, 1,3-dimethylbutyl, 2,2-dimethylbutyl, 2,3-dimethylbutyl, 3,3-dimethylbutyl, 1-ethylbutyl, 2-ethylbutyl, 1,1,2-trimethylpropyl, 1,2,2-trimethylpropyl, 1-ethyl-1-methylpropyl, and 1-ethyl-2-methyl-propyl.
24. (previously presented) The composition according to claim 23, wherein the alkyl group is methyl, ethyl, n-propyl, or isopropyl.
25. (previously presented) The composition according to claim 18, wherein the alkandiyl group is selected from the group consisting of methyl, ethyl, propyl, isopropyl, butyl, 1-methylpropyl, 2-methylpropyl, 1,1-dimethylethyl, n-pentyl, 1-methylbutyl, 2-methylbutyl, 3-methylbutyl, 1,1-dimethylpropyl, 1,2-dimethylpropyl, 2,2-dimethylpropyl, 1-ethylpropyl, hexyl, 1-methylpentyl, 2-methylpentyl, 3-methylpentyl, 4-methylpentyl, 1,1-dimethylbutyl, 1,2-dimethylbutyl, 1,3-dimethylbutyl, 2,2-dimethylbutyl, 2,3-dimethylbutyl, 3,3-dimethylbutyl, 1-ethylbutyl, 2-ethylbutyl, 1,1,2-trimethylpropyl, 1,2,2-trimethylpropyl, 1-ethyl-1-methylpropyl, and 1-ethyl-2-methyl-propyl.
26. (previously presented) The composition according to claim 25, wherein the alkandiyl group is methyl, ethyl, n-propyl, or isopropyl.
27. (previously presented) The composition according to claim 18, wherein C<sub>8</sub>-C<sub>20</sub>-alkyl is selected from the group consisting of octyl, decyl, undecyl, dodecyl, tridecyl, tetradecyl, pentadecyl, hexadecyl, heptadecyl, dodecadecyl, nonadecyl, and eicosyl.

28. (previously presented) The composition according to claim 18, wherein the alkenyl group is selected from the group consisting of 2-propenyl, 2-butenyl, 3-butenyl, 1-methyl-2-propenyl, 2-methyl-2-propenyl, 2-pentenyl, 3-pentenyl, 4-pentenyl, 1-methyl-2-butenyl, 2-methyl-2-butenyl, 3-methyl-2-butenyl, 1-methyl-3-butenyl, 2-methyl-3-butenyl, 3-methyl-3-butenyl, 1,1-dimethyl-2-propenyl, 1,2-dimethyl-2-propenyl, 1-ethyl-2-propenyl, 2-hexenyl, 3-hexenyl, 4-hexenyl, 5-hexenyl, 1-methyl-2-pentenyl, 2-methyl-2-pentenyl, 3-methyl-2-pentenyl, 4-methyl-2-pentenyl, 1-methyl-3-pentenyl, 2-methyl-3-pentenyl, 3-methyl-3-pentenyl, 4-methyl-3-pentenyl, 1-methyl-4-pentenyl, 3-methyl-4-pentenyl, 4-methyl-4-pentenyl, 1,1-dimethyl-2-butenyl, 1,1-dimethyl-3-butenyl, 1,2-dimethyl-2-butenyl, 1,2-dimethyl-3-butenyl, 1,3-dimethyl-2-butenyl, 1,3-dimethyl-3-butenyl, 2,2-dimethyl-3-butenyl, 2,3-dimethyl-2-butenyl, 2,3-dimethyl-3-butenyl, 1-ethyl-2-butenyl, 1-ethyl-3-butenyl, 2-ethyl-1-butenyl, 2-ethyl-2-butenyl, 2-ethyl-3-butenyl, 1,1,2,-trimethyl-2-propenyl, 1-ethyl-1-methyl-2-propenyl, and 1-ethyl-2-methyl-2-propenyl.

29. (previously presented) The composition according to claim 28, wherein the alkyl group is 2-propenyl.

30. (previously presented) The composition according to claim 18, wherein the alkynyl group is selected from the group consisting of 2-propynyl, 2-butynyl, 3-butynyl, 2-pentynyl, 3-pentynyl, 4-pentynyl, 3-methyl-2-butynyl, 2-hexynyl, 3-hexynyl, 4-hexynyl, 5-hexynyl, 3-methyl-2-pentynyl, 4-methyl-2-pentynyl, 2-methyl-3-pentynyl, 4-methyl-3-pentynyl, 1-methyl-4-pentynyl, 1,1-dimethyl-2-butynyl, 1,1-dimethyl-2-butynyl, 1,1-dimethyl-3-butynyl, 1,2-dimethyl-3-butynyl, 1,3-dimethyl-2-butynyl, 2,2-dimethyl-3-butynyl, 1-ethyl-2-butynyl, 1-ethyl-3-butynyl, 2-ethyl-2-butynyl, 2-ethyl-3-butynyl, and 1-ethyl-1-methyl-2-propynyl.

31. (previously presented) The composition according to claim 30, wherein the alkynyl group is 2-propynyl.

32. (previously presented) The composition according to Claim 18, wherein the cationic cytosectin is selected from the group consisting of:

N,N',N"-trioctyl-N,N,N',N",N"-pentamethyl-bis-(2-ammonioethyl)-ammonium bromide;

N,N',N"-tridecyl-N,N,N',N",N"-pentamethyl-bis-(2-ammonioethyl)-ammonium bromide;

N,N',N"-tridodecyl-N,N,N',N",N"-pentamethyl-bis-(2-ammonioethyl)-ammonium bromide;

N,N',N"-tritetradecyl-N,N,N',N",N"-pentamethyl-bis-(2-ammonioethyl)-ammonium bromide; N,N',N"-trihexadecyl-N,N,N',N",N"-pentamethyl-bis-(2-ammonioethyl)-ammonium bromide; N,N',N"-trioctadecyl-N,N,N',N",N"-pentamethyl-bis-(2-ammonioethyl)-ammonium bromide; ethanediyl-1,2-bis(dimethyldecyl ammonium chloride); ethanediyl-1,2-bis(dimethyldecyl ammonium iodide); ethanediyl-1,2-bis(dimethyldecyl ammonium dihydrogenphosphate); ethanediyl-1,2-bis(dimethyldecyl ammonium thiosulfate); ethanediyl-1,2-bis(dimethyldecyl ammonium sulfate); ethanediyl-1,2-bis(dimethyldecyl ammonium oxalate); ethanediyl-1,2-bis(decyl dimethyl ammonium bromide); ethanediyl-1,2-bis(dodecyl dimethyl ammonium bromide); ethanediyl-1,2-bis(tetradecyl dimethyl ammonium bromide); ethanediyl-1,2-bis(hexadecyl dimethyl ammonium bromide); ethanediyl-1,2-bis(octadecyl dimethyl ammonium bromide); propanediyl-1,3-bis(decyl dimethyl ammonium bromide); butanediyl-1,4-bis(decyl dimethyl ammonium bromide); and butanediyl-1,4-bis(octadecyl dimethylammonium bromide).

33. (previously presented) The composition according to Claim 18, wherein the neutral lipid or lipid-like molecule is selected from the group consisting of dioleoylphosphatidylethanolamine (DOPE), 1,2-dioleyloxyphosphatidylethanolamine, cholesterol, and dioleoylphosphatidylcholine (DOPC).

34. (previously presented) The composition according to Claim 18, further comprising a co-lipid molecule for forming a stable composition.

35. (previously presented) The composition according to Claim 34, wherein the co-lipid molecule is selected from the group consisting of lecithin, phosphatidylcholine, dioleylphosphatidylcholine (DOPC), phosphatidylethanolamine (PE), phosphatidylserine, phosphatidylglycerine, phosphatidylinositole, sphingomyeline, cephaline, cardiolipin, phosphatidic acid, cerebroside, diacetylphosphate, lysophosphatidylethanolamine, dipalmitoylphosphatidylcholine, dioleoylphosphatidylglycerol, dipalmitoylphosphatidyl-glycerol, palmitoyloleoylphosphatidylcholine, palmitoyloleoylphosphatidylethanolamine, diheptadecanoylphosphatidylethanolamine, dilauroylphosphatidylethanolamine, dimyristoylphosphatidylethanolamine, distearoylphosphatidylethanolamine, beta-linoleoylgamma-palmitoyl-phosphatidylethanolamine, and beta-oleoyl-gamma-palmitoylphosphatidylethanolamine.

36. (previously presented) The composition according to Claim 18, further comprising a cell targeting component.
37. (previously presented) The composition according to Claim 36, wherein the cell targeting component is a ligand selected from the group consisting of hormones, carbohydrate ligands, growth factor, neurotransmitters, fragments thereof, and modified forms thereof.
38. (previously presented) The composition according to Claim 36, wherein the cell targeting component is selected from the group consisting of antibodies, lectins, peptides, proteins, carbohydrates, and glycoproteins.
39. (CURRENTLY AMENDED) The composition according to Claims 37 or 38 Claim 36, wherein the cell targeting component is a neutral co-lipid or negatively charged co-lipid ~~covalently linked to said exogenous compound~~.
40. (previously presented) The composition according to Claim 18, wherein the peptide, peptide derivative, protein, or protein derivative are antigenic.
41. (previously presented) The composition according to Claim 18, wherein the peptide or protein derivatives are selected from the group consisting of cyclic peptides, peptidomimetics, peptides or proteins containing non-natural amino acids, and peptides or proteins containing non-natural bonds between amino acids.
42. (previously presented) The composition according to Claim 18, wherein the nucleic acid is selected from the group consisting of natural nucleic acids, synthetic nucleic acids, single-stranded nucleic acids, double-stranded nucleic acids, genomic DNA, cDNA, plasmids, DNA vectors, antisense nucleic acid, antisense RNA oligomers, ribozymes, DNA oligonucleotides, nucleosides, RNA, DNA/RNA hybrids, nucleic acids containing phosphorothioates, and nucleic acids containing phosphoramidates.
43. (previously presented) The composition according to Claim 42, wherein the plasmid comprises an unmethylated CpG dinucleotide.

44. (previously presented) The composition according to Claim 42, wherein the DNA oligonucleotide is an oligonucleotide that is complementary to a coding region of a gene, a 3' untranslated region of a gene, a transcription control sequence of a gene, or that comprises an unmethylated CpG dinucleotide.

45. (CANCELED)

46. (CANCELED)